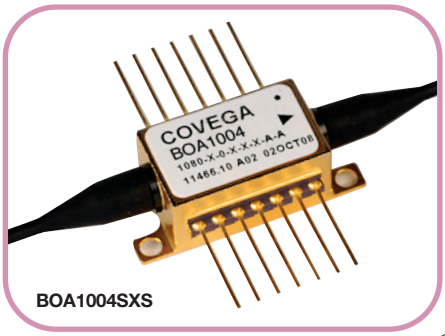
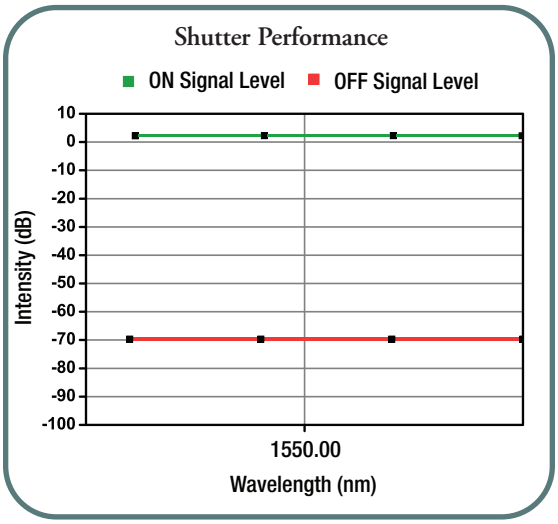
Semiconductor Optical Amplifier as an Optical Shutter Switch



The SOA1013SXS and BOA1004PXS Optical Switches are designed specifically for applications requiring an optical shutter in the 1530 to 1570 nm range. Both the polarization-independent SOA1013SXS and the polarization-dependent BOA1004PXS provide isolation greater than 60 dB. The devices are based on our semiconductor amplifier platform consisting of a highly efficient InP/InGaAsP Multiple Quantum Well (MQW) layer structures grown on an InP wafer and processed into a proven reliable ridge waveguide. The device can operate as a lossless, high-speed, optical isolation switch, a full-range variable optical attenuator (VOA), or an optical shutter for protection of delicate optical equipment.

SOA as an Optical Switch

- Polarization-Dependent and Polarization-Independent Versions
- High Fiber-to-Fiber Gain
- On/Off Isolation >45 dB
- High Switching Speed of <1 ns
- Available as SM Fiber-Pigtailed Butterfly
- FC/APC Connectors. Key Aligned to Slow Axis on BOA1004PXS
- Typical Applications Include LIDAR Systems, Remote Sensing Systems, and Cavity Ring-Down Sensors



The SOA1013SXS polarization-independent switch features the right combination of low polarization sensitivity, wide optical bandwidth, and high extinction ratio for an optical isolation switch. Using the gain/absorption properties of the MQW structure, the device can function as an optical blocking shutter with no reflections. In addition, the switch is also designed to support the highest gain and signal levels, allowing it to function reliably at signal levels of 15 dBm and above. The SOA1013SXS is also ideal for applications where the input signal polarization is unknown or fluctuates.

The BOA1004PXS polarization-dependent switch offers the user full control of the power level making it ideal for high-power laser pulse generation systems like cavity ring-down sensors and LIDAR systems. The device comes in an industry-standard 14-pin butterfly package with PMF pigtails that are terminated with FC/APC connectors and key aligned to the slow axis. The BOAs can be customized upon request to have isolators on the input, output, or both. Please contact Tech Support for help customizing a device for your application.

Optical Power Meters

See Pages 1265-1284

ITEM#	SOA1013SXS			BOA1004PXS		
Parameter	Min	Typical	Max	Min	Typical	Max
Operating Current	–	500 mA	600 mA	–	500 mA	600 mA
Operating Wavelength	1528 nm	–	1562 nm	1528 nm	–	1562 nm
Optical Isolation (P_{IN} / P_{OUT}) @ 0 mA and 1550 nm	45 dB	–	–	40 dB	–	–
Extinction Ratio (On/Off @ P_{IN} = -20 dBm and 1550 nm)	–	60 dB	–	–	70 dB	–
Switching Speed	–	1ns	–	–	1 ns	–
Max Output Power for CW Input Signal	–	17 dBm	–	–	18 dBm	–
Max Output Power for Modulated Input Signal	–	9 dBm	–	–	10 dBm	–
Saturation Output Power (@ -3 dB)	12 dBm	14 dBm	–	13 dBm	15 dBm	–
Small Signal Gain Across BW (@ Pin = -20 dBm)	10 dB	13 dB	–	25 dB	28 dB	–
Polarization Dependant Gain	–	1 dB	1.5 dB	–	–	–
Noise Figure	–	8.0 dB	9.5 dB	–	8.0 dB	9.5 dB
Forward Voltage	–	1.6 V	1.8 V	–	1.6 V	1.8 V
TEC Current*	–	0.23 A	1.5 A	–	0.23 A	1.5 A
TEC Voltage*	–	0.5 V	3.5 V	–	0.5 V	3.5 V
Thermistor Resistance*	–	10 kΩ	–	–	10 kΩ	–

* TEC Operation (Typ/Max @ TCASE = 25/70 °C)

ITEM#	$	£	€	RMB	DESCRIPTION
SOA1013SXS	$ 1,854.00	£ 1,285.00	€ 1.646,00	¥ 15,656.00	1550 nm Polarization-Independent Optical Shutter/Switch, Butterfly, SMF, FC/APC
BOA1004PXS	$ 2,218.00	£ 1,537.50	€ 1.969,00	¥ 18,729.00	1550 nm Polarization-Dependent Optical Shutter/Switch, Butterfly, PMF, FC/APC